Gas Journal

VOL. 305. 113th YEAR. LONDON, JANUARY 11, 1961 No. 5080. PRICE 1/6

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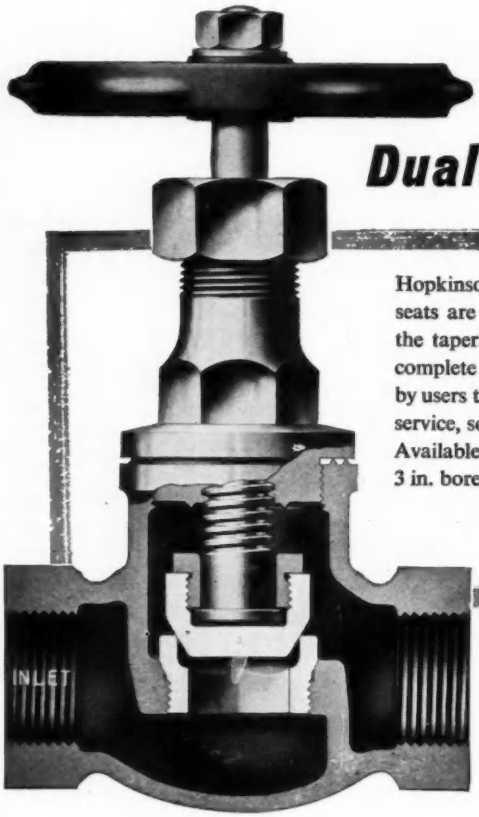

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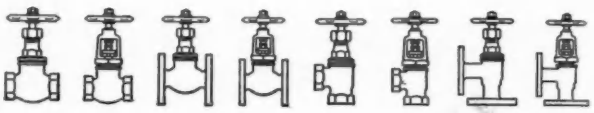

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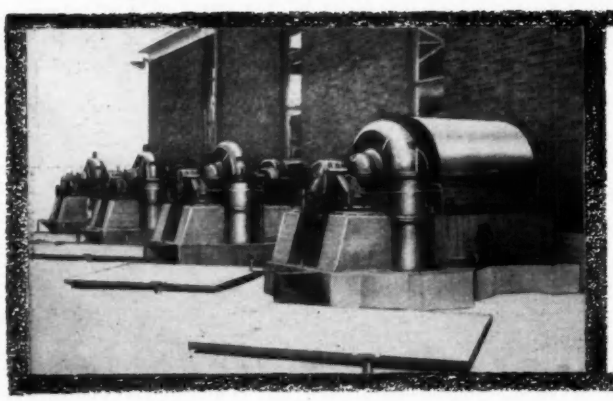

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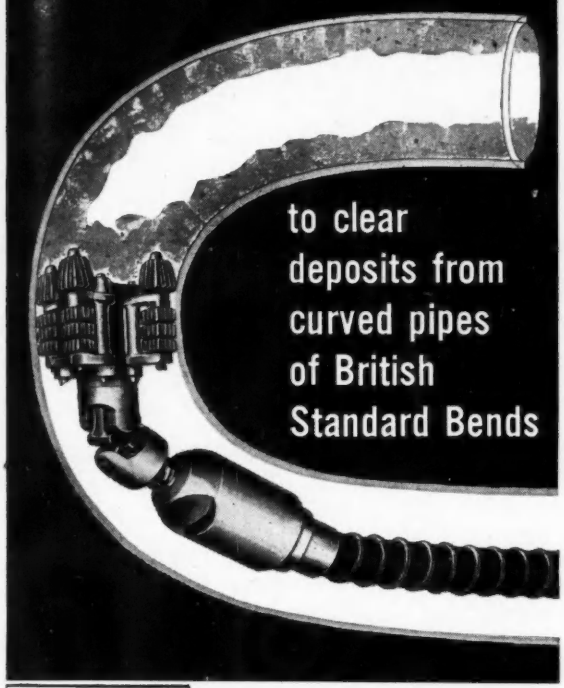

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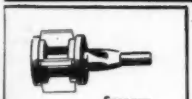

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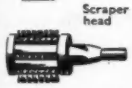

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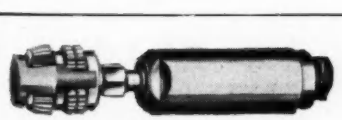

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Gas Journal

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WEDNESDAY, JANUARY 11, 1961

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Publishers' Notice See Page 570, December 28, 1960

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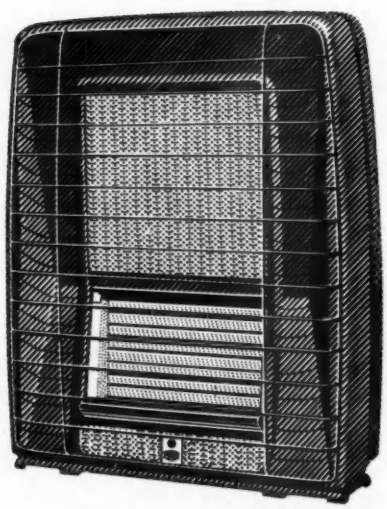

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Gas Journal

COKE OVENS • BY-PRODUCTS • CHEMICALS

What is a fair price for gas?

WE are constantly asking ourselves what should be the proper price for fuel and power, and it would certainly take an accountant well versed in the intricacies of gas and electricity costing to give us a convincing answer. A paper read to the Manchester and District Section of the Institution recently by Mr. S. G. Deavin, Member and Secretary of the North Western Gas Board, gives us a very definite clue to the many factors which must be taken into account, and the abstract which we are publishing this week will, we think, bring home to our readers how great has been the break with the industry's traditional methods of pricing in the years since nationalisation.

It may have been something of a coincidence that in the November issue of *The Banker* there appeared an article under the title 'What Price for Power,' which covered the wider field of all three nationalised fuel industries. If we had needed any confirmation of Mr. Deavin's arguments, this article would have supplied them.

The importance of this lies in the attention now being given to the finances of the fuel and power industries, since any increase in fuel costs so seriously affects other manufacturing costs. Severe competition between each fuel is probably a good thing; it has the merit of keeping each industry on its toes, and prevents a slothful, easy-going approach to vital commercial problems. Such problems are every bit as important as the technical problems of production and manufacture. In fact, it might well be said that of the two, the latter might be the easier to solve. If Mr. Deavin's paper does nothing else, it does at least stress the need for persuading the public to buy a first-rate fuel at prices which at first sight may appear to be slightly enhanced. This can only be effectively done by framing appropriate promotional tariffs.

In the past the electrical industry seems to have been cleverer than our industry in this respect. It has a commodity to sell that for certain special purposes is superior to gas, and with the universal acceptance of electric lighting, gas had to gracefully retire from that particular field. But once electricity had its toe in the door, it began to sell itself with imagination and vigour.

After the 1914-18 war when electricity networks were spreading, it was vital to step up the load factor, and so prices for 'lighting' and 'power' were offered, the latter being a fraction of the lighting price. The gas industry does not seem to have quite grasped the possibilities of the promotional tariff until after nationalisation, when the big rates of increase from pre-war gas consumptions had returned once more to normal rates and finally became almost static.

The charging for gas by block consumptions seems to have been the most favoured way of giving the larger consumer preferential prices, but this does not really meet the situation. The housewife who has an emergency gas ring which is never used until 'the power goes off,' should pay a considerably higher price for her gas than that in the highest block rate. Her supply is delivering gas at a total cost per therm to the undertaking considerably in excess of that to a regular customer who, though gas-minded, may seldom actually reach the second block. She is clearly paying far too much for her gas.

The introduction by the gas industry of the fixed charge and a reduced commodity charge was only possible if the consumer could be shown quite clearly that gas could perform some particular heating task better and ultimately more cheaply than another fuel of lower commodity cost. Once in, electricity could conceal its fixed charge in a higher commodity charge for a fixed number of units varying with the size of the house. Since this could be largely absorbed in the quantity of electricity used for lighting, the price of power appeared to be very cheap. This and the lower utilisation efficiency of gas, made many who were anxious to increase their standards of comfort without employing extra domestic labour turn to electricity.

Modern means of space heating, such as hot air convection, convector room heaters and gas-fired central heating, have now made it clear that there is a considerable market for gas in this particular field. The framing of a suitable promotional tariff should do all that is necessary in selling the load. This is basically a winter load, however, and to prevent high peak load cost occurring in the winter it must be balanced out by a summer load—for example, a water heating load.

The problem facing the price fixing departments of the various boards, therefore, is to find a price to cover all costs and yet be attractive to the potential consumer.

Except for industrial consumers who can negotiate special prices within certain limits, the average customer thinks little of the actual price per therm—if indeed he or she understands the meaning of the phrase—but is very much concerned with the total bill at the end of each quarter. If by co-operation with the appliance manufacturers highly efficient and trouble-free appliances can be made available, for the comfort and little trouble involved, we feel that the domestic consumer will accept the tariff, if properly framed—provided his pocket still remains relatively intact.

On the other hand, the price must not be too cheap. Although a low commodity price is most attractive to the consumer and may well get the industry a lot of business, it may do the boards a great deal of harm; this applies to all three nationalised industries. The article in *The Banker* is at pains to stress that Government policy has done a great deal to take away any incentive for these industries to build up financial reserves. We have referred to the difficulties facing the National Coal Board in this respect on more than one occasion, but it also applies to gas and electricity as well; in times of high demand considerable reserves might have been realised. The electricity industry, expanding at the rate it has done since nationalisation, and the tremendous advances in power generation techniques, has concealed somewhat its lack of reserves, though it must be remembered that the expansion in its production capacity has largely been met by Treasury loans as with gas and coal.

We are convinced that equality of charge to all consumers, considered at one time by many to be the aim of the nationalised industries, is fair to no-one, least of all the loyal gas consumer. Each should be charged a price proportional to the cost of supplying any individual load, but unless the impasse caused by too low commodity prices in the nationalised fuel industries can be effectively solved, there is very little chance of there ever being sufficient resources available for each industry to be responsible for its own capital investment without calling for Treasury help.

Though this must be the aim of the industries concerned, in the meantime each must sell its particular product. If the principles enunciated by Mr. Deavin are put into practice, there seems every likelihood of this being realised.

Junior Therms

THE national final of the Gas Council's Miss Therm and Master Therm Competition swept to a very satisfactory climax on January 4 when Linda Shelley (Southern) and John Tyler (Eastern), both aged 15, were selected from the 24 competitors as being the girl and boy with the best all-round ability and knowledge of general housekeeping and cookery, and safety in and out of the home. Placed second were Amanda Lloyd (North Eastern), aged 17, and John Vivian (South Western), aged 15½; third, Susan Ede (Eastern), aged 14, and Eric Hill (Southern), aged 16; fourth, Elizabeth Martin (Wales), aged 17, and Ian Veale (South Eastern), aged 15.

All the youngsters taking part put on a good show under extremely harrowing conditions, and we were glad that one of the judges made reference to the calmness and aplomb with which they faced the ordeal. Those who seem all too ready to despair of modern youth should have gained comfort from the fact that 8,000 young people between the ages of 7 and 17 were interested enough to take part in a competition primarily based on the domestic arts. Sir Henry Jones, the Chairman of the Gas Council, took the opportunity to put in a word for modern youth, pointing out that despite what the pessimists said about the younger generation, 'Fings never were what they used to be.'

The responsibility for presenting the prizes was placed in the graceful, capable and distinguished hands of Lady Barnett who, despite her link with the East Midlands Gas Board, is not *always* associated with our particular fuel.

The test was divided into three sections—cookery, home safety and road safety. All competitors were tested in each section, the time allowed being one-and-a-quarter hours per section.

Everything about this competition seemed to us to be worthwhile. It linked gas with teenagers—the very people the industry is most anxious to court—and by its nature it evoked co-operation from schools, colleges and parents; moreover, it had the active support of *Girl*, *Eagle*, *Princess* and *Children's Newspaper*. In the past we have at times been a little sceptical concerning the real value of some of the national competitions sponsored by the industry, but this one has our vote every time. It is good publicity and good preparation for future markets.

One last word of congratulation—on the attractive design of the kitchens which successfully overcame the formidable problem of harmonising with the somewhat overwhelming décor of the Café Royal.

The I.G.E. Journal

THIS month sees the debut of the Institution of Gas Engineers' Journal, the publication of which is designed to lighten the heavy burden imposed by the production of transactions, and by absorbing such details as forthcoming events, election of officers, etc., to replace the Bulletin. The idea is in many ways a sound one, and it has the merit of bringing the I.G.E. into line with other engineering bodies which boast their own journals. The cost has been offset by the inclusion of advertising.

To judge by the first issue, however, the new Journal will do little to help publicise the activities of the various Sections and Junior Associations, since their papers and discussions are condensed so severely as to do little more than indicate the nature of the subjects covered. The bulk of the space, 61 out of the 80 text pages, is devoted to last November's Autumn Research Meeting. The difficulties besetting the gas industry's 'free' Press are highlighted by the fact that, despite this generous allocation of space, the journal manages to deal with only one complete paper and discussion! Here the inflexibility of an 'official' journal may prove to be a serious stumbling block to the maintaining of interest, for whereas a 'free' journal can select, abstract and manœuvre to its heart's content and to its readers' advantage, the transaction-type journal has little choice but to pursue its prescribed course.

From a paper to the Manchester and District Section, I.G.E.

Pricing in the gas industry

By S. G. DEAVIN, O.B.E.,

MEMBER AND SECRETARY,

NORTH WESTERN GAS BOARD

TARIFF policy in a gas undertaking has a dual responsibility. First, to ensure that in the various sectors of the market the prices charged for gas are no less than the costs incurred, so that supply costs, in total, will be fully covered by sales income; and secondly, to assist in the promotion of sales, in the various markets, by ensuring that the prices charged are no higher than is required to cover the costs, so that every cost advantage is fully exploited in competition with rival fuels.

For far too long the gas industry in Britain was slow to appreciate that an efficient tariff system on these lines, appropriate to modern conditions, where gas is sold in a large variety of heating, cooking and processing markets, each with its own characteristic cost and competitive conditions, demands a much more complex and flexible system of pricing that the traditional flate rate of charge, which is a relic of the era when gas was sold almost exclusively for lighting. It is true that statutory restrictions often operated to prevent changes from being made to keep pace with the transformed markets, but these were by no means the only reason for the slavish adherence to systems of charge based on average costs and average performance. Even the challenge of the electricity industry's two-part tariffs many years ago and steep block pricing methods were not countered when it became possible by similar tariffs, except by a few farsighted and adventurous suppliers.

Re-modelled tariffs

Since the nationalisation of the industry in 1949 tariffs have been largely re-modelled in order to reflect costs more closely. The progressive integration of production and distribution systems too, has brought successive movements towards standard tariffs within the gas boards' separate areas and it is clear that within the process of standardisation the basic fact that the first increment of supply is more expensive than subsequent increments has at last been accepted. The ideas now being incorporated into tariffs are largely those that were widely canvassed in the 1930's and are not likely to represent the full extent of what must be done to fit the industry for the competitive struggle of the 1960's. The vigorous search for new gas production techniques and new markets for gas in which the industry is now engaged calls for an equally bold and imaginative approach to tariff policy.

Gas quality is of some importance, and it is true that considerable progress has been made over the last 30 years in the reduction of the quantity of sulphur in manufactured gas, but more often than not the quantity is regulated by the so-called 'economics of supply.' The electricians say that they have a clean fuel, and it would be much to our benefit to provide gas with a clean flame even if it meant higher gas prices. The flame has still many, many advantages over any other form of heat transfer, but we seem to have forgotten this basic fact. We should have taken action as an industry to supply clean gas a long time ago, and we should now no longer hesitate. Sooner or later we shall have to supply gas which is non-toxic in character, and I hope that not too many people will have forsaken its use before we are ready to take action.

Restrictive provision

The provision about undue preference and undue discrimination in the Gas Act is unduly restrictive and prevents the full use of commercial practices in our pricing. It is, of course, linked with the craving for uniformity which has lately grown up and which is mistakenly equated with fairness. In fact, the need for price discrimination has long been recognised particularly in public utilities and tariff systems have operated in the electricity, telephone, air transport and even gas services which discriminate between demand which entails the use of additional capital equipment and 'off-peak' demand that can be met from plant that is already available to meet other use. This sort of discrimination is not only proper but fair for if different patterns of use impose different costs upon the supplier it is clearly fairer to charge each according to cost than to charge the same price to all. Such a system has been adopted by the electricity interests with the result that domestic gas sales particularly have been seriously affected and continue to be severely threatened.

Price discrimination on purely commercial grounds is very pronounced in the oil industry and here the gas industry is also faced with the keenest competition. A formula which inhibits their own commercial freedom, either to reflect marginal costs in their pricing, or to take action to develop a class of business to influence future cost trends, is not in the interests of customers or boards and should therefore be removed.

At the same time it is essential to recognise that departure from the strict principle of cost responsibility on the grounds say of capacity to pay, strength of competition and similar factors should be applied always to classes of consumption and should not be confined to selected individuals or trades.

The purpose, structure and application of tariffs have had constant study by members and officers of the North Western Board and a major change in the structure of the published tariffs has been effected.

The development of the tariff structure and systems of charge in the North West is fairly typical of tariff changes that have taken place throughout the industry, although there are still vital differences from board to board which can only be ironed out as experience proves the one to be more successful than the other. On the other hand, the basic principle of pricing as far as is practicable according to cost responsibility is now widely accepted though not, perhaps, applied to the extent that it profitably could be. Responsibility for certain aspects of costs as applied to classes of consumer is bound to be a 'notional' concept and, of course, administrative considerations must limit the degree of price discrimination which is possible, but statistical survey can assist in making the allocations of cost more precise and many of the anticipated administrative difficulties that have worried some of us in the past have in fact not arisen or, if they have, have had to be overcome in order to keep pace with our competitors.

Cost advantages

The immediate task of the industry is to maintain and increase the sales of gas and the revenue from the sales using existing production techniques until new methods of gas supply are developed. Studies of the distribution of gas usages and load characteristics could provide a basis for re-modelling tariffs still further to reflect more closely the special cost advantages of gas, and could determine the wider application of special contracts, of two-part tariffs for non-domestic users and the use of 'capacity' tariffs to encourage the greater sales of gas. The arguments against 'purpose' loads are well founded but there is little authentic evidence of the character of usage and therefore of responsibility for costs of the many different 'process' loads. Research in this field could lead to adjustments in price probably at small cost in lost revenue but could also have a major effect in stimulating new load. The introduction of price concessions during the summer months for the encouragement of the use of gas for domestic water heating and refrigeration, in conjunction with space heating in the winter and for industrial processes in which other fuels are used during the winter might appear not only possible but desirable and justified.

Night gas use survey

A survey carried out to ascertain the incidence of the use of gas at night in a particular industry on its demand for storage capacity and thus, for cost responsibility, although very limited in character, formed the basis for a logical extension to the special agreement terms which were made available by the Board to all whose pattern of gas usage enabled them to qualify. The study could have been taken further to include an assessment of the customer group's share of production and distribution capacity costs which are likely to represent more important cost categories for non-domestic users than storage capacity costs. However, the importance of this and similar surveys is clear. It is only by a carefully planned and executed study of the load characteristics of particular groups of customers that reasonably accurate assessment can be made of the adequacy of current charges or, put in another way, of the correctness of 'inducement' level of price. And the lack of this vital consumption and customer information properly acquired through statistical survey could conceivably have been the cause of the industry being placed in a much less advantageous position vis-a-vis our competitors than perhaps we ever need have been.

It has frequently been said that the next five years will be a severe testing period for the gas industry but, equally, that they will be years of great opportunity. An enlightened tariff policy can do much to ensure that a steady rate of expansion is resumed but the 'new look' tariffs which have lately been introduced must continue to be improved and made more flexible.

There could, for instance, be a much wider use of the two-part tariff system of charge for both domestic and non-domestic customers tied perhaps to installed capacity. It could be that the larger gas central heating installations could justify on the grounds of cost different terms for both standing charge and commodity rate than could the smaller units. An alternative method which recognises this fact is the hybrid form of tariff which combines the standing charge of the two-part system with a block system of commodity prices.

Seasonal gas pricing which would reflect the usually lower cost of supplies during the summer has often been proposed for the industry, but very little has as yet been done. The extra gas demand in the summer could be met at the cost only of materials, labour and essential maintenance involved in coal gas manufacture and this is between 2d. and 3d. per therm cheaper than the cost of the same ingredients in the production of peak load carburetted water gas. Thus, it would appear that there is scope for a summer/winter tariff that reflected this difference in marginal costs.

A summer price concession could not, however, be financed at the present time, but if the efforts that are being currently made to sell space and water heating for use continuously during the winter are as successful as planned, surplus monies which become available could be used to provide cheaper gas prices during the summer in turn to stimulate sales.

Contracted supplies

The industry has good reason for not allowing the usage of gas at separate premises unless on a single site to be aggregated for the purpose of charge, but could it be that its concern to observe this rule has caused them to overlook the possible benefit of contracted supplies? It is possible that a guaranteed minimum purchase of gas under contract by a customer could have a favourable effect and might merit a contract price applied in the form of a discount or alternatively on the basis of a 'premises charge' for the benefit of aggregated consumption.

The problems connected with the prepayment meter will acquire greater significance in the future if the anticipated greater consumption of gas by domestic customers is realised. It is surely unthinkable that the benefit of a heating tariff should not be given. The meters will have to be adjusted to preserve a balance between obtaining the full payment required by ensuring that a high proportion of the annual standing charge is secured during say 30 weeks of the heating season and preserving the conviction in the customer's mind that gas is in fact cheap as well as efficient. This will probably best be achieved through different price settings to the meter in the two heating periods from those in the other period(s). An alternative would be the weekly collection of the standing charge with payment for gas through the meter.

The area boards have replaced the individual undertakings as the responsible commercial units and are required to balance their finances, they must, therefore, be free to fix their own prices. On the other hand, it is equally true that each area board is a part of a national industry in which the achievements of each one are reflected in the image of the whole.

New sources of gas supply and new methods of manufacture will lead inevitably to a national grid, and rationalisation of thought to lead to uniformity in the general form

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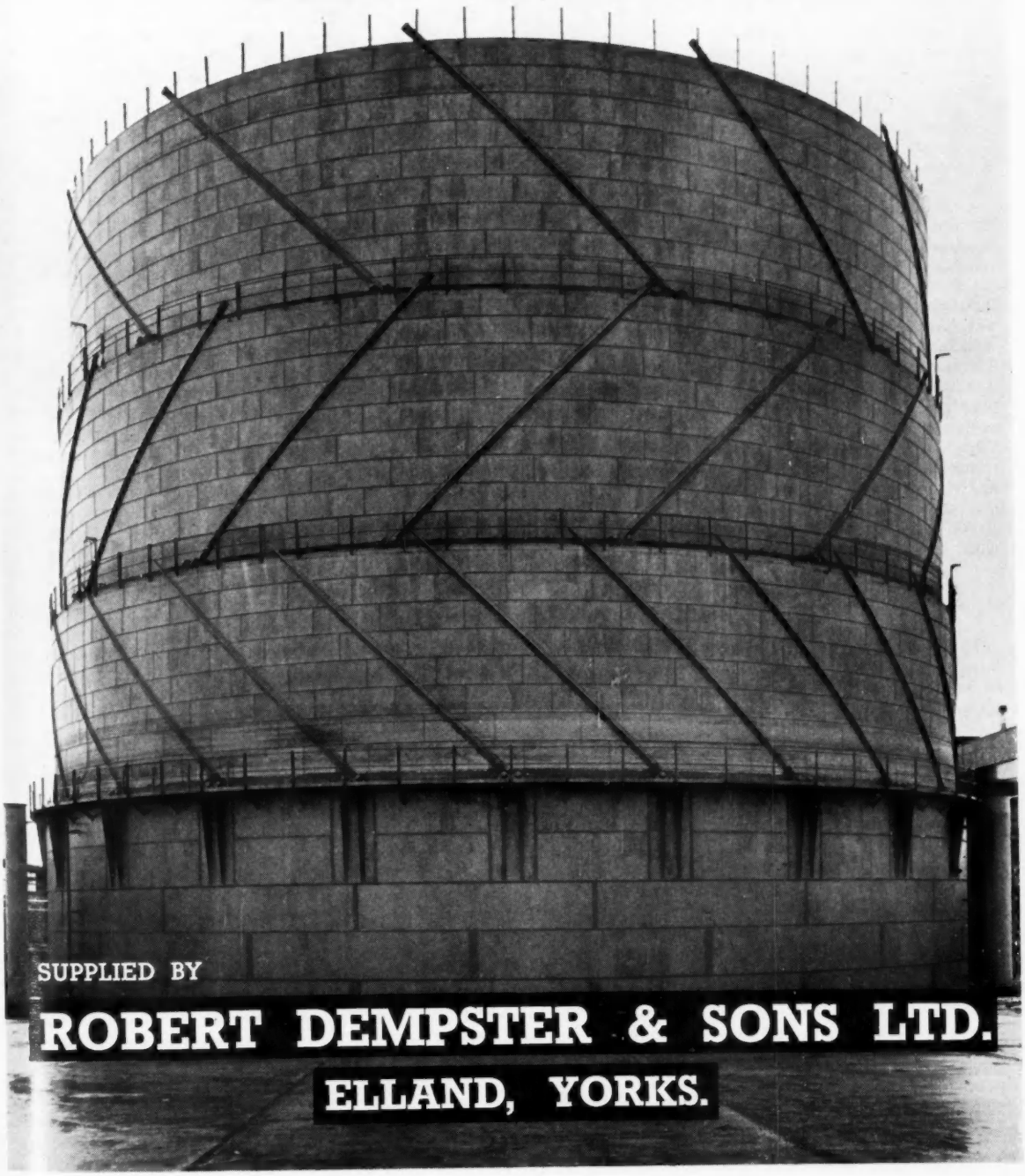

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of tariff structures is necessary because it will be beneficial. It is likely, too, that better opportunities for the greater use of gas will arise in some areas than in others and it would be unfortunate if any one of these boards were unable to finance immediately a price structure which would secure the business. Is it too outrageous to suggest that a national pricing pool could be set up to supply the necessary money to enable a board to pursue particular markets? Such a pool could be subscribed to by every area board and could be administered by the Gas Council who would ensure that the basic principle of pricing according to cost was observed and financial assistance given to a board could be repayable annually over a short term of years. A contribution of ⅛d. on all gas sold would have produced in the year 1959/60 over £1.3 mill. and in five years on that basis £6½ mill. would be in the fund for use to promote the expansion of the industry as a whole.

Appliance sales

Examination of the annual reports of the Gas Council for the past five years shows clearly that the return from the sales of appliances is restricted to the profit made from the sales of gas. According to the financial accounts the cash value of appliances sold during that period was of the order of £167½ mill. and the net charge to revenue account was slightly more than £1½ million. Traditionally the gas industry has only seldom been persuaded that the simple hiring of appliances is a good thing, but newer industries have for some time now developed the rental business for all kinds of articles in daily use to a degree which formerly would have been thought not possible. Throughout the country there are still twice as many rented houses as owner occupied, and many of these tenants would also like to hire their heating and cooking appliances. This preference has been borne out by experience in the North West when during a period of eight months at a time of restricted hire purchase terms, simple hire was introduced and out of a total disposal of 43,000 water heaters, 30,000 sink heaters were installed on rental. This compares with 19,000 water heaters sold during the whole of last year when hire purchase was completely unrestricted.

For water heating

The industry surely cannot disregard the opportunity for large sales of gas for water heating alone which are there to be realised only if rental terms are made available to those who prefer that method of payment. A simple hire system for new and modern appliances can operate successfully alongside a hire purchase scheme and should be adopted. If we do not take this action we shall obtain only a relatively small portion of a very considerable market. And our competitors will benefit. If there is doubt about the ability of the industry to finance this kind of transaction the possibility of enlisting the interest of a finance company should be investigated.

Much greater flexibility of both thought and action in relation to the pricing of the industry's products and primarily of gas will be required for the future than has been applied in the past to tackle the changed prospects and the keener competition that now face the industry. More accurate pricing in relation to cost will be more complex, it will require a much greater knowledge of customers and of their consumption, and it will bring new administrative problems. By facing up to these problems, however, the industry will be better able to exploit the cost advantages of gas in the many fields of use in which they apply.

DISCUSSION

Mr. W. Hodkinson, Deputy Chairman, N.W.G.B., who presided, said a new look should be given to gas pricing, a subject which was just as important as finding new methods of production and distribution. The industry was now attacking the domestic space heating load. It recognised that such a load might create long-term problems because it was likely to be required for as little as 30 weeks within a period in which was concentrated 75% of total annual gas output.

A suitable tariff to encourage water heating to stimulate the summer load would help to ease the situation and this was the time to start planning for it.

Mr. W. B. Harrison, Central Lancs. Group, said it was a little unfair to suggest that the industry had been tardy on this question of pricing. The gas industry had a responsibility to deliver non-toxic gas as soon as it was possible to do so, but it must come about in relation to the commercial aspects. The cost of reducing toxicity could not be divorced from the economics of production. At the present time gas was too dear, and the time was not opportune to consider adding to the cost.

Much had been achieved in the last four years in reducing the sulphur content; at one works with which he was acquainted, it had been reduced from 18 grains to 12 grains per 100 cu.ft., and engineers were confident of a further reduction to 10 grains in the near future. The removal of carbon monoxide, he believed, must come about gradually, since conditions varied from area to area.

Two-part tariff

The promotional two-part tariff, a bold and courageous step, had to be tied to encouraging the public to install additional appliances in order to achieve enhanced gas sales. Such a tariff was intended to encourage the public to demand higher standards of house heating.

Much work had yet to be done in collecting information on load development, the times when gas was consumed and relevant factors to enable the industry to forecast the demands to be made on it more accurately. It must go out for special purpose loads, in the commercial as in the industrial fields.

Mr. J. Castle, Mersey Group, contended that any form of preferential tariff discriminated between one consumer and another. His own view was that if they could give no satisfactory reason for selling gas at different prices to different consumers they must at least admit that they were showing undue preference, but this need not inhibit a freedom of flexibility in charges.

The basis of charging should be what it cost to make the commodity and what it cost to make it available to the customer. If the price of the commodity was going to vary between one customer and another, he asked what should be taken into account in framing an escalator clause.

Any system of charging should be applicable to the widest range of consumers; the constituent items contributing to the cost of gas should be readily understood, after full regard for fluctuations and variations in the load had been taken into account. Such conditions might be met by a fixed charge based on maximum installed capacity.

Mr. P. R. Dawson, Board Headquarters, said promotional tariffs were only successful if they resulted in increased sales, but the consumer would not make a change unless it was better or cheaper.

On price, gas was up against strong competition from oil, but it might be able to exploit the price advantage with electricity. The industry must get its prices down to

a level at which it remained profitable to produce, but low enough to discourage consumers turning to alternative fuels.

There were three factors which justified offering gas at prices below those normally in force; these were (a) off peak loads, (b) large loads, and (c) consumption at a high load factor.

It was even sometimes economic to supply gas below cost price, since by taking on a new load, the overall cost of supplying the gas, taking into account the overheads and the installation costs, was reduced.

Mr. A. K. Collinge, West Lancs. Group, emphasised the problem of pre-payment meters. The ideal system for space heating would be for the local authority to collect a regular sum with the rent, but it was doubtful if they would agree to do this.

He asked whether a deposit system could be developed whereby the board held a sum in hand and installed credit meters. The initial deposit could be accumulated by retaining rebates from repayment meters until the necessary amount had been accumulated.

In this way there would be some security against bad debts.

Mr. J. Grayston, North Cheshire Group, said the proper approach to the industrial load was by a four-part tariff.

On the subject of the simple hire of appliances, he said that in the gas industry they had always been told this did not pay, but if the finance houses could make it pay in the hiring out of television, washing machines, and other classes of goods, he could not see why the gas industry could not do the same.

Mr. S. G. Pickles, N.E.G.B., said some incentive should be given to the consumer to use more gas. The question of usage facilities offered must be taken into careful account when deciding tariffs.

Mr. R. L. Greaves, South Lancs. Group, welcomed the approach to make tariffs more flexible.

Mr. Risby, Southport, said the sale of gas on a thermal basis created difficulties because many people had difficulty in understanding it.

He had explained to them that at 1d. per unit, electricity was regarded as cheap, 30 units of electricity cost 2s. 6d. compared with 1s. 3d. per therm or ½d. per unit for gas.

Another member suggested that the gas industry had stuck too long to Mr. Therm, invaluable as he might be in advertising. The public had difficulty in understanding tariffs and that was not a good thing.

The tariffs in the North West had gone as far as they could for the small block of early therms. Any cheapening would be more likely to result in a loss, rather than a gain, in revenue.

Mr. M. Redman, Board Headquarters, pointed out that if carbon monoxide was replaced by hydrogen the calorific value of gas would be reduced and, in effect, the price would be increased.

There was no case for more than two fuel services in the home. One of these would be electricity, and gas must be made attractive enough to be the other; central heating had a good load factor for 30 weeks of the year.

More needed to be done to encourage the commercial heating loads, and there was a good case for a two-part tariff for commercial users.

School heating was another load worth cultivating, so why, he asked, should agreements not be made with the educational authorities.

Mr. Deavin, replying to the various points, said that enough was not known about the net cost of, say, the removal of sulphur from gas.

He believed that in time both sulphur and carbon monoxide would be removed and that with a clean safe fuel, the industry would have a very great sales advantage. Their removal would, in fact, be the greatest technical development since the regulo was fixed to the gas oven.

He expressed surprise that no one had said anything about coke. The industry would have to think seriously about its system of selling coke and other smokeless fuels because bulk distribution to domestic consumers would greatly increase within the next few years.

BOOK REVIEW

ADVANCES IN PETROLEUM CHEMISTRY AND REFINING, VOL. 3

Edited by John J. McKetta, Jr.

THE third volume in this series continues the publication of special articles covering the most recent advances in the techniques of the petroleum industry begun two years ago. The intention to publish a volume each year is being adhered to, and as each appears, it is quite remarkable the way the momentum of the original purpose is being maintained.

Each volume is divided up into the same five main groups, the first of which is concerned with economics, and the fifth with mechanical equipment in the industry, the intervening groups covering some aspect of petroleum science or technology. So quickly, it seems, are these techniques changing that a different aspect can be treated quite fully in each volume by specialists on any particular subject.

Although of little direct application to the gas industry as such, much of the subject matter to be found in the series so far will be of interest to chemists and chemical engineers working in our industry. In fact the last section Recent Advances in Cooling Towers may be of considerable interest to gas engineers.

In any case the possession of a collection of monographs, as these individual contributions might be fairly described, will be of great assistance to any scientific worker in any industry in which there may be similar processes to those in the petroleum industry. A more up to date ' text book ' might be difficult to find.

An excellent index, includes a cumulative section covering all three volumes.

★

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From the Chairman's Address to the South Western Section of the I.G.E., Bristol.

Improving production methods

By A. C. REA,

WORKS ENGINEER AND MANAGER, BATH,

SOUTH WESTERN GAS BOARD.

SINCE nationalisation my primary duties have been on the production side of the Board, and I should like to refer to a few aspects of the function of a gas engineer relative to improving production methods.

The yardstick of success is indicated by the cost of gas into holder—comparative statements, each four weeks, provided by the accountancy section, assess the results of previous efforts.

One of the greatest possibilities for savings is in the operation of producers where very considerable tonnages of fuel are consumed. The normal process, as originally fitted to the continuous vertical retort benches at Bath, was to use run of retort coke with high pressure steam jets in venturis for controlled air admission. The high pressure steam jets have since been converted to utilise low pressure steam obtained from the exhausts of constantly running plant such as exhausters and other prime movers, and the fuel now contains all screened breeze surplus to requirements, and up to 50% has been successfully utilised, maintaining a carbon dioxide figure of 17½% to 18½%.

Retort steaming

All retort steaming is also drawn from the low pressure system, which is operated at 15 to 20 p.s.i., and the low pressure requirements are balanced by variations of prime movers between electric and steam drives, and further controlled by make up and blow off valves.

With the considerable improvement in ash content of fuels, the clinker periods have been successfully reduced—from the days of using horizontal coke made from Somerset coals when eight-hour clinker periods were necessary, to 24 hours today, with a reduction from three-men per shift to two-men at present operating ten step grate producers. The fuel used on producers has also improved from 2.5 cwt. per ton to the current figure averaging under 2.2 cwt. per ton, or 2.8 lb. per therm of gas produced. This later indication is probably a better criterion of working efficiency since it is based on the cost datum of the therm of gas as opposed to the ton of coal.

While it is inevitable that a certain amount of coke will be removed during fire cleaning, this in turn can be recovered, and an ash screening plant has been operating for some years now handling all run of producer ash by separating this into four sizes over two reciprocating screens and a movable belt from which the clinker is picked. The ash is divided as follows: (a) 0 to ⅜-in. sold for breeze-block making; (b) ⅜ in. to 1¼ in. used as fuel on Lancashire boilers; (c) 1¼ in. to 3½ in. sold as clinker, which has been handpicked from a travelling belt on a piece-work basis. The residual 1¼-in. to 3½-in. coke is re-used on the producers or carburetted water gas plants. The ashes are loaded by Chaseside shovel, also on a piece-work rate, into an overhead hopper which feeds the screens through a jigger. The reduction in producer fuel is of the order of 3 cwt. per ton, and the credit from coke, fuel and ashes brings in a net reduction of 1s. 2d. per ton of coal carbonised.

One bench of producers, which are of the step grate type, has been tapped and gives ¾ mill. cu.ft. per day of producer gas at 130 B.t.u. per cu.ft., which is used at peak demand to augment works output. The other bench of five producers has been fitted with an augmentation flue to increase steam output from the two waste heat boilers when p.f.d. is used in the continuous vertical retorts for further gas output at peak periods, or to curtail the production of coke by reducing carbonisation. Over 3,000 lb. of additional steam is available per hour thus avoiding keeping hand-fired boilers in readiness to meet the extra steam demands. A test, with and without augmentation, gave the results shown in Table 1.

TABLE 1

Result of steam augmentation on Nos. 7 and 8 waste heat boilers

	Augmentation	
	Without	With
Steam pressure p.s.i.	117—120	117—121
Evaporation, 000 lb/hr.	4·2+4·5= 8·7	5·9+6·1= 12·0
Evaporation increase, 000 lb/hr. ..	—	3·3
Inlet temperature, °C.	910	925
Outlet temperature, °C.	215	230
Augment. flue temp., °C.	—	1,030
Fan motor, amps.	20	26
CO_2 inlet boiler, %	17·0	14·5
Fuel consumption, tons/day ..	26	31·5

The two boilers receive the waste gases from five producers serving 28 vertical retorts, but each was designed to take heat from 18 retorts when one boiler is down for annual inspection. There was, therefore, boiler capacity available for increased loading. Where there are a number of diesel engines driving essential plant the augmentation flue is also a useful standby in the event of diesel shut down where alternative steam prime movers are available.

In 1952 a new continuous vertical retort installation was completed by Woodall-Duckham consisting of two identical benches each of 28 82-in. retorts. It may be interesting to show the overall results during the life of these settings up to the time of their first resetting—see Table 2.

TABLE 2

Overall results—continuous vertical retorts

	Bench No.		Averages
	2	1	
Put to work	July 1952	Oct. '52	—
Shut down	April '58	Mar. '59	—
Working life, yrs.	5⅔	6½	—
Coal carbonised, tons	386,296	443,105	—
Gas made, mill. cu. ft.	6,991	8,019	—
Calorific value, av.	—	—	465
Therms made, 000's	32,528	37,312	—
Producer fuel, cwt/ton	—	—	2·63
Coke ex retorts, cwt/ton	—	—	11·62
Breeze ex retorts, cwt/ton	—	—	2·88
Tar produced, gal.	—	—	15·2
Therms per ton	—	—	84·2

When to reset a bench of vertical retorts without taking undue risks of plant failure is not very easily assessed.

From results above it is seen that No. 1 bench operated for eight months longer than No. 2, carbonising 56,809 tons of additional coal, giving a nominal saving on the resetting account of approximately £10,000. Visual observations and measurements had indicated, after five years continuous operation, that both benches were in very good condition and a further useful life could be anticipated, but in order to stagger the resetting of the two benches, and assessing that approaching seven years was the ultimate limit of safe working, No. 2 bench was dropped at 5⅔ years, and No. 1 during the following summer at 6½ years.

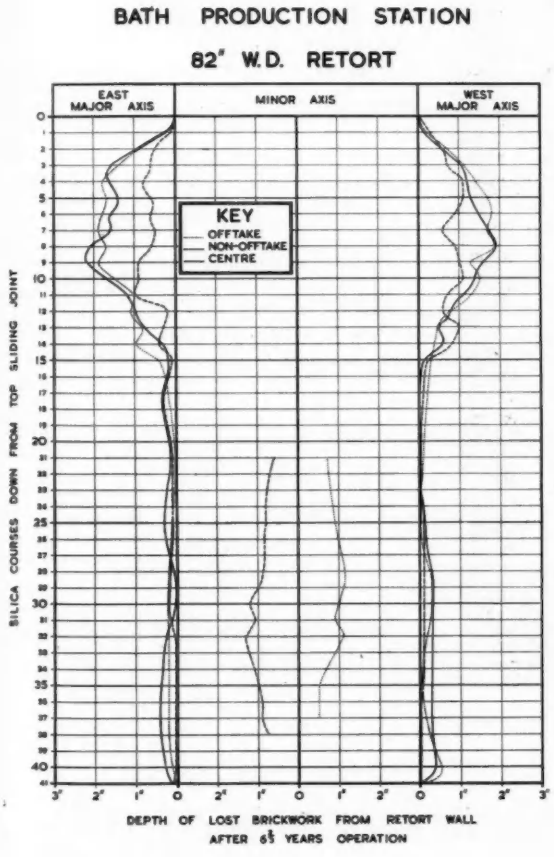

Fig. 1.

To enable a closer assessment of the preferable useful life to be obtained, careful measurements and observations were made on No. 2 bench during the dismantling of one of the retorts, and these are illustrated in Fig. 1.

The general condition of the top firebrick was good, and the amount of wear so small that only a few measurements were taken. The wear tended to increase as the retort was descended.

The wear in the silica zone was characteristic in taking place in well-defined areas. From the top sliding joint down to courses 15 and 16, there was an area of spalling. This spalling zone was almost entirely on the major axis walls, and in most retorts, areas of brickwork had worn back to, and beyond, the tongue, *i.e.*, over 2 in. of the 3 in. thickness of the original dimension. Despite this heavy wear there was no evidence that leakage had taken place, probably because this area is normally sealed by scurf, and it would seem that spalling would not limit the life of retorts.

Brickwork wear

Immediately below the spalling zone the wear of the major axis brickwork was very small, but the area of wear spread out on the minor axis further down the retort and covered the whole face at courses 30 and 35 to a depth of from 1 in. to 1½ in. Around and below this level there was considerable ash attack on the minor axis walls, and most of the serious leaks were in this region, some bricks having been actually holed by ash attack. Practically all the serious leaks were in the corners between the minor and major axis, and it was clearly these leaks which would eventually limit the retort life. Behind some of the leaks there was clear evidence of the flue brickwork having been badly attacked by impinging coal gas leakage.

The bottom firebrick was in good condition, the greatest wear being on the sealing blocks. Again there was no evidence that the amount of wear in this region would in any way limit the retort life.

From the examination of the retorts the opinion was formed that if the leakage at the corner joints of the lower silica courses could be reduced or controlled the life of the retorts could be extended. Although there was a large loss of brickwork from the spalling zone, it was proved, during dismantling, that this area was structurally still quite strong. Examination of some of the leaks which had been welded suggested that it would be profitable to attempt more welding from the flue-side. Retorts are scurfed on a 28-day cycle, and airborne sealing has been practised from the start.

The first 100 years

For the first 100 years in the life of our industry, gas was made from coals carbonised in horizontal retorts of varying sizes and materials, and the success of the Bath Gas Light and Coke Company was based on the use of local Somerset coals in this type of plant. The time has come when this method of gasmaking is being abandoned for a number of reasons: (a) The inevitable discharge of smoke and grit; (b) the arduous nature of the labour involved; (c) the quality and quantity of the coke produced, with the present difficulty in selling it; (d) the development of more modern methods of gasmaking; (e) the ground space occupied; and (f) the sinking of capital in renewing out of date equipment. Two reasons which probably so far cannot be put forward are, on economic grounds, and the wide flexibility of output in meeting varying demands.

Bath started gasmaking in 1818 with 20 cast iron retorts

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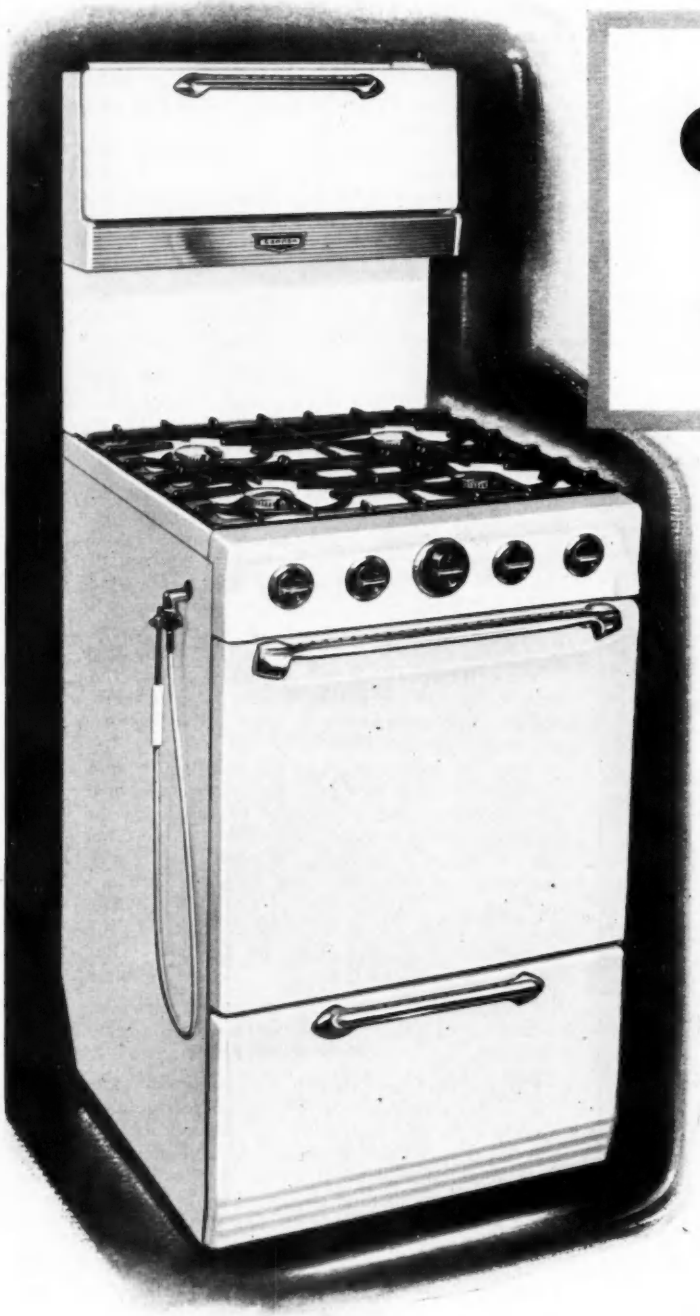

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2 ft. long by 13½ in. diameter with a reserve of a further 12. Later, railway facilities became available, and in 1871 a new retort house of 31 settings of eight operated until the blitz on Bath on April 26, 1942. In 1925 a bench of 14 beds of tens (Drakes) 24 in. by 18 in. by 23 ft. was started up, followed in 1939 by a similar installation giving a total additional output of 5 mill. cu.ft. per day. This plant, with up to 60% of carburetted water gas carried the Company through the war years, and up to nationalisation.

As mentioned earlier, two benches of continuous vertical retorts were put to work in 1952. Since then the role of the horizontals has been that of a peak load plant. With the successful use of p.f.d. in place of gas oil on water gas plants giving an increased output of up to 40% with reforming and high peak, and the further use of p.f.d. on the continuous vertical retorts the works output can be met without resort to the old horizontals. I should, however, like to record, for the sake of history, the results obtained from one bench of these horizontals operated during the year 1959/60, and from which it can be seen that they contributed substantially to the efficiency of the station. See Table 3.

TABLE 3
Operation of one bench of horizontals 1959/1960

Coal carbonised, tons	37,486
Gas made, 000 cu. ft.	461,326
Calorific value	595
Therms made	2,746,436
Therms per ton	73·26
Producer fuel, cwt/ton	3·2
Coke ex retort house, cwt/ton	10·0
Breeze ex retort house, cwt/ton	2·5
Tar produced, gal./ton	10

The horizontals were adopted at Bath in order to carbonise the one-time relatively cheap and high-swelling Somerset coals. These local coals can only be carbonised in continuous vertical retorts up to a limited percentage, and while exceptionally low in moisture, contain some 7 to 9% inherent ash plus the liability of shale. Coke quality was, therefore, seriously affected, and with the recent emphasis on improved fuel horizontal coke was taken off the market some 18 months ago, and used internally on producers and water gas plants. Subsequently Somerset and Welsh coals were removed by the Board from their purchases. This has made it possible to produce a first-class solid fuel with acceptable inerts and re-activity.

A study of the four-weekly average proximate analysis of coals tested over the past three years shows the improvement in coal quality and the resultant effect on the coke produced. Table 4 indicates in percentages the trends from the proximate analysis.

TABLE 4
Trends from the proximate analysis of coals tested

	Coal				Coke			
	H_2O	Ash	Vol.	F.C.	H_2O	Ash	Vol.	F.C.
1957	3·8	6·0	31·8	58·4	7·7	7·6	0·5	84·2
1960	3·8	3·8	33·8	58·6	8·2	4·6	0·8	86·4
Variation ..	nil	−2·2	+2·0	+0·2	+0·5	−3·0	+0·3	+2·2

There are other ancillary advantages besides an improvement in coke quality: Increased output from the use of this better quality in producers and water gas plants; less clinker and ash to handle; reduced wear and tear, and reduction of labour. The marked improvement in coke quality is also having a very favourable effect in obtaining new customers for our solid fuel, and has given the coke sales force a product which they can confidently offer. With grading within plus or minus 5% of the nominal limits, and the use of debreezing screens on all four sizes of coke, we can press our product, the increased sale of which would be the quickest present method of reducing our costs of gas.

The inevitable trend in production is to concentrate manufacture in large and modern units for obvious economic reasons, and distribute the gas to existing and new areas by an integrated system of high pressure gas from the various works. This means that consumers may receive their supplies from different works with a variety of gas-making units. At the Bath works, while the main supply is from continuous vertical retorts, this has added to it from time to time (a) carburetted water gas using p.f.d. or gas oil for enrichment; (b) reforming in carburetted water gas plants, or continuous vertical retorts using p.f.d.; (c) peak load gas from carburetted water gas plants; (d) producer gas, and (e) up to last winter horizontal gas.

From this mixture benzole may be recovered. While we maintain the calorific value within the Referees' prescription, and keep the Wobbe index within the G.5 range, other factors, less evident to the production engineer, may be affecting the service to the consumer. To check these insidious characteristics I had all the various individual

1. J_H change in heat input $= \dfrac{H\sqrt{D_a}}{H\sqrt{D}}$ — Limits ·9 to 1·1

2. J_A change in primary air $= \dfrac{A\sqrt{D_a}}{A\sqrt{D}} + 10\%$

3. J_L change in tendency to lift $= \dfrac{J_A\ S\ (100-Q)}{S_a(100-Q_a)}$ — Not less than ·64

4. J_F change in tendency to light back $= \dfrac{S - 1{\cdot}4\ J_A}{Sa + 0{\cdot}4}$ — Not more than ·08

5. J_Y change in tendency to produce yellow tip $= \dfrac{J_A + N\text{–}Na}{110} - 1$ — Not more than ·14

6. J_I change in tendency to produce incomplete combustion $= \dfrac{J_A - 0{\cdot}366R}{R_a - 0{\cdot}634}$ — Not greater than zero, but an increase to ·05 would probably be tolerated.

gases analysed by the Area Chemical Engineer's section, and the likely permutation of mixtures examined to ensure that whatever the gas sent out of the works it would not be adverse to any appliances.

Burner adjustment is not, in general, highly critical, and allows more or less latitude in the gas characteristics without noticeable lowering of efficiency. Burners vary in design and purpose, and vary in their ability to tolerate changes in gas composition, but experience has indicated that certain limits can be fixed for changes in gas characteristics, and provided these limits are kept satisfactory operation may be expected. Weaver introduced six indices based upon a comparison of the new gases with the normal gas, and these are quoted at the foot of the preceding page.

The subscript 'a' indicates the gas for which the appliance was adjusted.

Where H = Calorific value;
D = Specific gravity;
A = Cu.ft. air required to burn 1 cu.ft. gas;
S = Flame speed factor;
Q = Percentage of oxygen;
N = Number of carbon atoms in 100 molecules of gas easily liberated on combustion. It is taken to be the total number of carbon atoms in the hydrocarbon except one in each molecule of the methane series;
R = Ratio of the number of hydrogen atoms in the gas to the number of carbon atoms in the hydrocarbon.

It was comforting to know that all of 13 possible variations of gases, calculated from their separate proximate analysis and applied to the six Weaver indices, showed that none was outside the permissible limits by a safe margin. It is appreciated that other works on the integration system have basically different methods of gas production, dilution and peak load additives, but in the interest of the best service to our consumers, this point should be borne in mind.

A further aspect of gas distribution in integrated mains where large volumes of gas are being passed each day, is the deposition of condensation. Even with aftercoolers fitted on the outlet of compressors, their effectiveness depends on certain physical conditions, namely: (a) The temperature of gas before compression; (b) the extent of compression; (c) the degree of aftercooling; (d) the ultimate temperature of gas in distribution mains affected by ground temperature; (e) the volume of gas sent out, and (f) the resultant quantity of condensate.

It is not sufficient to assume that the gas before compression will be the ambient temperature since gas stored in gasholders is subject to the sun's radiation and wind and to atmospheric temperature. An hourly record has, therefore, been kept over the past three years of gas leaving the holders, *i.e.*, before compression, and these observations are shown in graphical form in Fig. 2, together with the temperature of the river water available as a coolant, the temperature of the gas on the outlet of aftercoolers after compression, the ground temperature at 2 ft. cover, and the gas temperature as metered at the extremity of an integration main (namely Calne meter after being compressed at Swindon some 16 miles away). The extreme summer and winter temperatures are also shown.

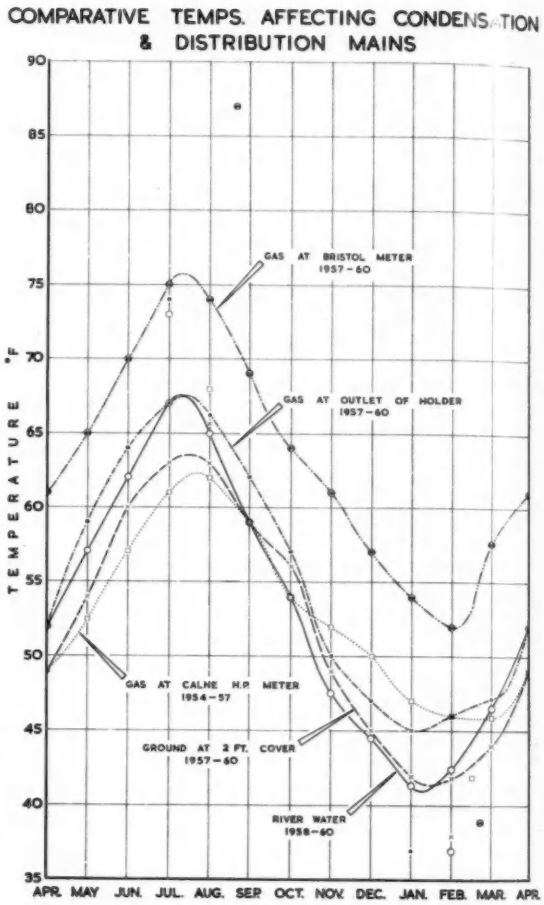

Fig. 2.

TABLE 5

Monthly average temperatures observed over three years.

Sequence from holders to integration mains	Summer		Yearly average	Winter	
	extreme	maximum		minimum	extreme
Inlet gas to compressors, °F.	74	67	52	45	37
Gas compressed	—	—	—	—	—
River water as coolant in aftercooler, °F.	73	67	52	41	37
Gas at outlet of aftercoolers, °F.	87	75	63	55	39
Ground at 2 ft. cover, °F.	66	63	49	42	38
Gas at end of integration main, °F.	68	62	52	46	42

Table 5 gives the average results of observations taken over a three-yearly period, and may more clearly show the wide variations to be expected when considering this problem.

The aftercoolers have the advantage of reducing engine room temperature, relieving thermal stress in mains, and connections, increasing the mains capacity, and reducing back pressure.

THE FUTURE OF PROFESSIONAL STATUS

By W. H. Johnson

THIS is a time of aggregations within the economic system, whether they take place under the banner of nationalisation, Mr. Clore, a motor corporation or a consumers' protection association. Mergers of that type are not necessarily wholly benevolent, nor need their motives rise above the level of sectional profit or politics.

It is a pleasure therefore, to turn to another form of combining which seems to be wholly beneficial both to those directly concerned and to most other people as well. This is the marriage between institutions of chartered engineers, and, in the news at the moment, that proposed by the Civils and the Municipals.

That others are contemplating the same sort of thing is certain, just as it is certain that again others are not. The new trend is, however, indicative of a reversal of thought on the subject.

Barricades were up

To go back a little, there were once a very few Institutions, fiercely jealous of their status, and the barricades were up against everyone who did not conform strictly to their narrow professional entry conditions. So a man who wished to specialise in steel structures, or automobile engine design, and sought to qualify, had to spend some of his life on the partly irrelevant syllabus of, say the Mechanicals or the Civils.

Hence, in course of time, the Structurals, Locos, Automobiles, Aeros, and the rest; not, perhaps, quite as simply as all that, for one must never lose sight of the proper pride of a specialist to be recognised as such. Pride, not snobbery.

It is pride which prompts a man to proclaim that in a world of engineers, he is an Engineer. And there is not a little snobbery in the refusal to recognise (particularly) the Institution of Gas Engineers as 'a senior institution'. Twenty years ago there was room for the small institution, made up of people devoted to an up-and-coming function. Now, there is nearly overcrowding, and the very multiplicity of societies could bring them all into question, at least to the layman.

It is not difficult to imagine, with the rapid broadening of technique and specialisation, that certain groups in the gas industry will find themselves more attuned to a limited field. Are we to expect, then, Institutions of Low Pressure Gas Engineers, of High Pressure Distribution Engineers, of Underground Gasification Engineers?

Please let the answer be 'No!' but only as a preliminary to the consideration of other possibilities. For example, is the Institution of Gas Engineers really necessary? (Adding, as a sop to the heresy hunters, 'in its present form').

Any serious thought about this is bound to be fogged with sentimental issues, none of which will have any importance ten years after the event.

But consider the present composition of the Institution. It is the focus of qualified status in the gas industry, and because of the expanding perimeter of the industry, includes people whose special field is instrumentation, construction, chemistry, solid fuels, and so on. Some are engineers (or Engineers, but we lack a proper definition) and many are not. No single definition will cover everyone who is morally entitled to seek membership, but are we better described as Fuel Technologists, for example?

There is a point to this reappraisal, for if amalgamation is in the wind, the choice of partners might be influenced by a definition of function. Fuel seems to be more apposite than Engineering in the industry's present mood, and under the general heading of Fuel would come, as well as gas, petroleum, heating and ventilating, and that most heterogeneous collection the Institute of Fuel. Electricity is not here included because there are so many reasons why it should be left out.

By a similar deductive process, the Mechanicals would embrace as equal partners all those whose interests are contiguous in the well-known examination syllabus definition, i.e., Mechanics comprises Statistics, Dynamics, Hydrostatics, Hydrodynamics, Whitaker's Almanack and a wet Sunday afternoon, and there is an interesting exercise in classification.

The autonomy, the protection and development of special interests, would be retained in every case (except where overlapping was eliminated) by the group system within the main framework.

Combined front

One of the Chemical societies has practised this for many years, and the Institute of Fuel should have applied it to its unwieldy brood.

To defend these proposals on the grounds of necessity would be difficult. The changes proposed are no more necessary than were the British Commonwealth, or N.A.T.O. But, as in those and many humbler cases, events create situations which upset the old order, and to meet which a combined front is the best answer, whether the need be for protection or advancement.

In its recent revision of the examination regulations the Institution of Gas Engineers has taken a step towards rationalisation, if that is the way to describe conformity with the 'seniors.' Only the details require to be reconsidered, in the light of the integration system outlined.

At first thought, the essential parts of an examination for candidature would be these:

1. The Common Preliminary, common to all. To test, first, the candidate's knowledge of his mother tongue

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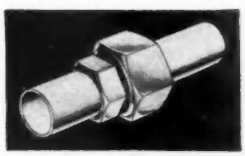

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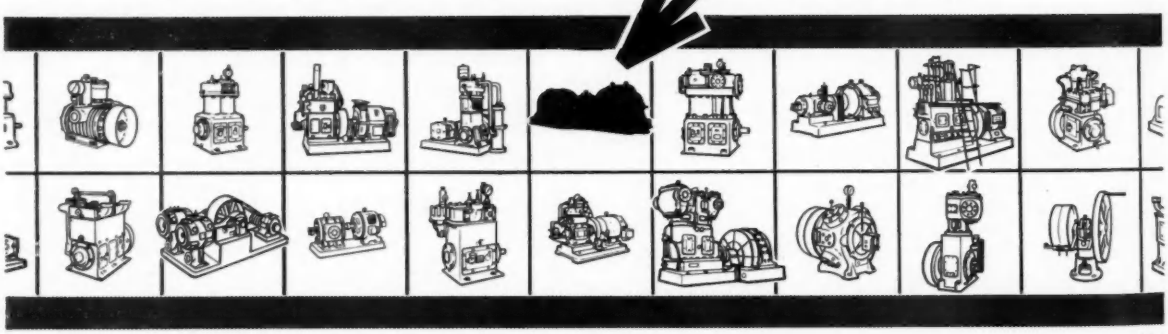

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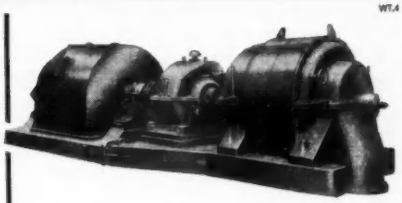


A Turbo Compressor or Exhauster for air or gas. These can be motor or steam turbine driven and are particularly suitable for large volumes at moderate pressures.

and his ability to use it aptly. Then to sound those basic principles of physics and mathematics upon which nearly all engineering and technology are ultimately based.

2. The Preliminary of the parent institution. To take fuel; all candidates would require to know the chemistry of fuels and combustion, the mechanics of the latter, and enough about the various fuels to be able to assess them comparatively.
3. The Membership examination of his special group within the main institution. It might be at two levels, for incentive value. Almost the only regret at the change in our examination system must be for the passing of the Diploma, that passport to the top rank of the best people.

Some of the weaknesses of the present system are revealed in diverse ways. Examiners lament annually that candidates cannot express themselves clearly, do not understand basic principles. Area boards expect many senior recruits to have a good knowledge of competitive fuels. Some currently qualified men are almost frighteningly parochial in outlook.

We could use the new broom and the new decade to put our house in such order that it would stand without need of further alteration for a long time. And if we do —or when we do—here is one who will be sentimentally sorry to see the end of our good friend the Institution. It might be some consolation, though, to try to earn a M.Inst.F.T.(Gas)(Hons.), to replace the M.Inst.Gas E.

Technical developments

The Muir-Hill 2WL Mark II loader, equipped with Sherman hydraulic power digger.

Digger loader

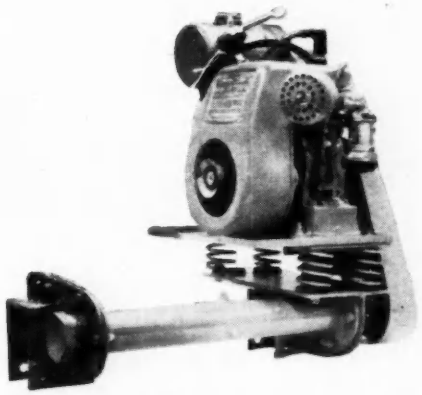
THE Muir-Hill 2WL Mark 2 Loader, introduced last year, by E. Boydell and Co. Ltd., is now available equipped with the Sherman hydraulic power digger or trencher.

A hydraulic pump in the Sherman digger unit is driven by an integral hydraulic motor which in turn takes its power supply through a pair of flexible hoses with self sealing couplings from the hydraulic system of the loader. The provision of a four pin attachment enables this power digger to step off the loader under its own power within a few minutes and to step back into position equally quickly, while connected with the loader only through the flexible hoses.—*E. Boydell and Co. Ltd.*

P.T.F.E. tape

DESIGNED to function as a thread sealant in ribbon form, Hilflon unsintered P.T.F.E. tape is manufactured from the inert non-toxic thermoplastic polytetrafluorethylene which possesses an exceptional thermal stability with a remarkable resistance to most known chemicals—acids, alkalis, oils, corrosive liquors and gases. Unaffected by weathering or ageing, it is cleaner and easier to apply than conventional sealing compounds and involves no messy tins, bottles and brushes.

Available in a compact roll packed in a metal container, it is easily stored, transported and dispensed. One layer of sealing tape makes a quick, easy application and provides a neat, clean joint. There is little chance of wastage due to negligence or exposure to the atmosphere as this tape never hardens, and is unaffected by temperature ranges between −450°F. and +500°F. Packed in rolls of ½ in. wide by approximately 520 in. long, it has a nominal thickness of .003 in. and a co-efficient of friction of .04 nominal.—*William Rose Ltd.*



The new Johnson Mark IV screed board vibrator, showing the all-steel vibrator housing.

Screed board vibrator

JOHNSON Mark 4 screed board vibrator has been introduced to supersede the Mark 3. The new model incorporates a more powerful engine, the Villiers Mark 12/1, developing 1.45 b.h.p. at 3,000 r.p.m. The new unit is however, 10 lb. lighter than its predecessor. Bowden control gear is now fitted as standard and is included in the price.

Also incorporated is an all-steel vibrator housing, and the multiple roller bearings running in oil-bath lubrication are still employed. Adjustable brackets have been incorporated, which can fit screed boards varying in width from 2½-in. to 3½-in. All major components are interchangeable with the old model and continuity of supply of spares is ensured.—*C. H. Johnson (Machinery) Ltd.*

Allen West and Co. Ltd., have published a book for private circulation named 'The Allen West Story', to celebrate the Golden Jubilee of the company. The book traces the development of the Company during those fifty years, its expansion at home and abroad, the work done during both world wars, and its present activities and expectations for the future.

North American Newsletter

Gas rides high, outlook brighter still

CANADIAN business experts believe that the 1,000 mill. cu.ft. export volume now expected with the grant of four permits is only a prelude to opening up of a fast-expanding and phenomenally large growth of market in the U.S.A.

The 1,000 mill. cu.ft. is made up as follows:

Alberta & Southern Gas Co., Ltd., to Northern California, 414 mill. cu.ft. a day.

Westcoast Transmission Co., Ltd., to Washington, Oregon and Idaho, 140 mill. cu.ft. a day.

Montana Power Company, for distribution locally in Montana, 30 mill. cu.ft. a day.

Trans-Canada Pipe Lines Ltd., to Minnesota and Wisconsin through the Manitoba lateral, 204 mill. cu.ft. a day.

COINCIDENCE

The fact that the Niagara falls average volume is the same as that at Emerson, Manitoba, is pure coincidence, as the former is 'interruptible gas' subject to the discretion of Trans-Canada as to when it has surplus supply that would otherwise have to be stored in Ontario.

There is said to be a much deeper significance to the 1,000 mill. cu.ft. per day than even the large size of these export contracts.

First, the volume to be added to Canadian gas sales by this means, in 1962, will be almost equivalent to the entire daily average gas sales in all Canada during the first half of 1960.

SPECTACULAR

Since it took something over 90 years from the initial discovery of gas in Ontario, for this figure to be attained, the current growth rate is nothing short of spectacular.

There has so far been no problem in finding the gas.

Geologists and reservoir engineers are convinced that gas will continue to be found ahead of demand all through Western Alberta and Eastern British Columbia.

The Canadian *Financial Times* says that it is not hard to visualise a second 1,000 mill. cu.ft. a day by the midddle of this decade going into the export market.

From Colin J. Godbold

● IN AMERICA the gas industry is riding high. So confident are utility and pipeline companies in the continued expansion of sales that they plan to spend $28,300 mill. in the next ten years against an outlay of $14,200 mill. in the 'Fifties.

The President of the American Gas Association, Mr. Wister H. Ligon, said the nation's 1,450 companies would expand the gas network by nearly 50%. He also quoted other forecasts that customers would increase by 40%.

'Since many of our gas systems already are operating at full or close to full capacity,' he said, '. . . we will have to add more than a quarter of a million miles to our gas network, increasing it from today's 596,000 to 878,000 miles by 1970.'

Mr. Ligon, who was addressing a gas conference, handed out verbal bouquets to the engineers present for converting every gas company in the country to natural gas over the past ten years.

They had built nearly a quarter of a million miles of new pipelines and mains in the same period and increased underground natural gas storage facilities five-fold, thus helping to triple the number of gas heating customers in a decade.

It is certainly true that there is a big swing towards the use of gas for house-heating. Last year 1.159 mill. consumers of gas for this purpose were added to the companies' lists, bringing the total to a record 20.2 mill.

The target is another 4 mill. home-heating customers by the end of 1962, two-thirds of whom will be in new property, the remainder being conversions from other fuels.

And these figures do *not* include individual systems in apartments.

Already 66.7% of the industry's consumers heat their homes by gas.

● ALASKA WILL be America's 47th natural gas State. Trenching operations at Anchorage began in August, and construction gangs are now laying 8-in mains for Anchorage Natural Gas Corporation.

These mains will be linked with an 80-mile pipeline between Anchorage and a recently-discovered gas field on the Kenai Peninsular.

1961—Canada foresees year's

THE President of the Canadian Gas Association, Mr. R. C. McPherson, thinks that 1961 will be a year of steady growth for the gas industry.

He says: 'The industry now has 1.15 mill. customers and the National Energy Board forecasts that national consumption will have reached 650,000 mill. cu.ft. a year by 1965 for an estimated income of more than $450 mill.

'This amount does not include the value of export sales of gas to the United States. It therefore would appear that with aggressive sales techniques, plus the superiority of the product over other forms of fuel, a good percentage of this gain in business can be achieved in 1961.

'On the export front, by 1962, seven pipelines will be carrying an estimated 400,000 mill. cu.ft. of natural gas across the border to the United States for a value exceeding $100 mill. This compares

The $12.8 mill. transmission line, also being built for Anchorage Natural Gas Corporation, will have a daily capacity of 71 mill. cu.ft.

Cost of the Anchorage system itself will be $4 mill.

● NOW THAT America is exclusively dependent on natural gas just how much of the stuff is there and how long will it last? At current levels of production, there is at least 100 years' supply. The estimated quantity of 'ultimate reserves' is approximately 1,400 bill. cu.ft.

There are also enormous quantities of gas known to exist in Canada and Mexico. It is thought that research workers will eventually perfect processes for producing synthetic natural gas from oil shales and low-grade coals.

One oil-shale deposit in Colorado is believed to contain 23 times more gas than present proved recoverable reserves.

The American Gas Association said that the Colorado deposit could provide an estimated 6,000 bill. cu.ft. of gas.

'The United States is in no danger of running out of gas in the foreseeable future.'

● GAS COMPANIES and appliance dealers can sell nearly 57½ mill. gas appliances during the next five years, the American Gas Association claims in a new analysis of domestic market potentials.

By accelerating the development of new models and putting more effort into sales promotion sales could exceed those of the years 1955-59 by 14.8 mill. units, says the report.

The break-down is: 18 mill. water heaters, 13.3 mill. cookers, 10.1 mill. space heaters, and 7.4 mill. central heating units.

It is also possible that 5 mill. clothes dryers will be sold, 3.3 mill. floor and wall furnaces, and 300,000 gas incinerators.

Half of the potential market—28.7 mill. units — represents replacement of existing equipment. Some 21.6 mill. appliances would be installed either in new homes or in homes already using gas for some purpose, and 7.1 mill. units would replace competitive equipment.

● PEAK HEATING load underground storage facilities for the American gas industry have cost nearly $700 mill. At the end of 1959 there were nearly 2 bill. cu.ft. of gas in underground storage.

Four states — Pennsylvania, Ohio, West Virginia and Michigan —accounted for more than two-thirds of the total gas in storage. The year's greatest gains in volumes of stored natural gas were recorded in Illinois, where the increase was 61%.

steady growth

with 85,000 mill. cu.ft. of gas exported in 1959 for a value of $17 mill.

Mr. W. H. Dalton, who is Managing Director, of the Canadian Gas Association, says: 'The year ahead of us is a year of challenge, but we look forward to witnessing the same upward trend in business through careful planning and aggressive selling.

'There is substantial new business available to the gas industry.'

Full blast now at Rapid City

NOW that the Emerson lateral pipeline hooking up the main Trans-Canada line at Ile des Chenes, near Winnipeg, with Minnesota and Wisconsin has been completed, the new Rapid City, Manitoba compressor station is working at full blast, send-out 204 mill. cu.ft. a day.

The big gas turbine, which cost Trans-Canada Pipe Lines Ltd. $3½ mill. to build, pumps natural gas on its way through 51 miles of 30-in. diameter pipe to the border where it will be further boosted to the American mid-West points.

A new Trans-Canada meter is also situated at Emerson, the border jumping-off spot.

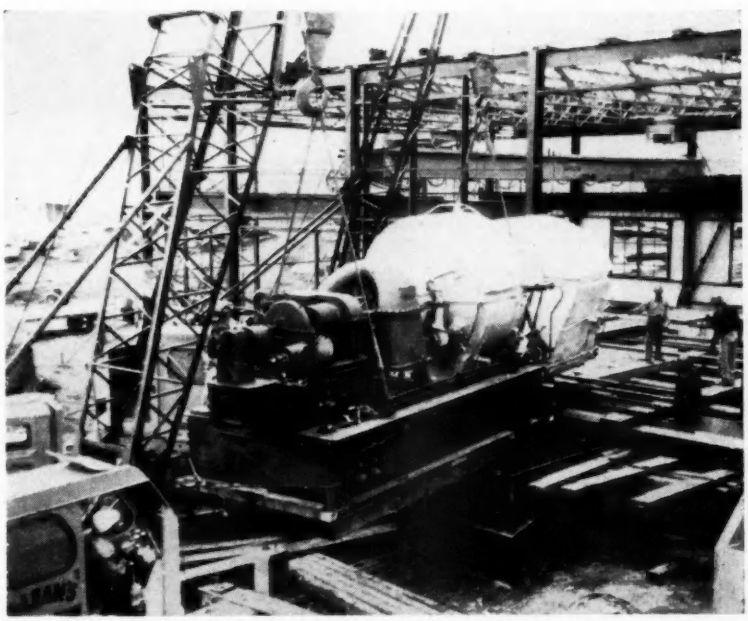
FIVE MORE

The unusual feature about this Rapid City plant is that Trans-Canada have not so far installed natural gas-operated turbines anywhere else on its system.

Another five such plants are earmarked for new spots in the prairie provinces of Manitoba and Saskatchewan.

Starting up and control is automatic through central panels in Toronto.

The gas turbine being moved in to the main compressor building at the new Rapid City gas pumping station hooking up the Trans-Canada line with a lateral to America's mid-West.



NEWS SUPPLEMENT

Joint Campaign opens to keep gas safe in Britain's homes

THE gas industry had two distinct objects in trying to prevent accidents in the home being caused by gas, said Sir Henry Jones, speaking on Monday at the opening of a joint campaign between the Royal Society for the Prevention of Accidents and the Gas Council, called 'Use Gas the Safe Way.' These objects were humanity and the straightforward commercial reason that the industry would much rather they did not happen.

Sir Henry said that in 1959, included in 7,000 deaths in the home in England and Wales, were 861 from town gas poisoning; 67% of these were persons over the age of 65, and 45% persons over the age of 75.

Of the causes of such deaths 84% were classified as being due to taps left open. Only 2½% were due to escapes from mains and service pipes and 1% to prepayment meters which had stopped and then restarted.

It was important to keep the problem in perspective, for it was part of a larger social problem, that of old age.

The gas industry had taken an enormous amount of trouble over this problem, said Sir Henry, and every year they tightened their standards. They were willing and ready to call on old people, and did their best to find out who the people were on whom they should call.

The Director-General of RoSPA, Brigadier Stoney, said that this campaign gave an opportunity to deal with one aspect of the problem of home safety. This was not done by stunt publicity; it was done by hard work in the field.

Mrs. Marjorie Byrne, Chairman of RoSPA's National Home Safety Committee, gave 13 safety hints for consumers.

RoSPA and the Gas Council have the full co-operation of all local authorities, local home safety committees and national voluntary organisations devoted to the various forms of public welfare.

Many Home Safety Committees are taking part in exhibitions, displaying posters and distributing leaflets through schools, youth clubs and old people's clubs, as well as women's organisations.

Lecture tours and film shows are also being arranged. Co-operation with other organisations such as St. John Ambulance and British Red Cross is also taking place.

NORWICH NEW WORKS MOVE

THE Ministry of Housing has given the permission required under the Town and Country Planning Act for the building of a new gasworks at Cremorne Lane, Norwich, for the Eastern Gas Board.

The works will rely entirely on cyclic catalytic reforming plant for gas production and will normally gasify light distillate.

The plant will include two MS 33 units and will have an initial capacity of 3.2 mill. cu.ft. of 500 B.t.u. gas, after enrichment with l.p. gases.

The plant will be built by Woodall-Duckham Construction Company Ltd. and is scheduled to be in operation before the end of 1961.

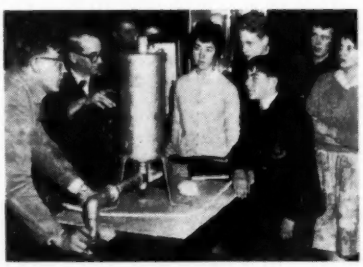
A plant of similar design, which will also gasify light distillate and produce 2 mill. cu.ft. of gas daily, is now under construction at the Cambridge works of the Eastern Gas Board and will be put into operation in the early part of 1961.

Scottish Board raises coke prices

AS a result of recent increases in distribution costs, delivered prices of gas coke and Gloco have been increased by 3s. 6d. a ton, or 2d. a hundredweight, states the Scottish Gas Board.

The new prices for gas coke delivered by the Board will range from 9s. 6d. a hundredweight or 186s. 6d. a ton in most of south and central Scotland to 10s. 7d. a hundredweight or 209s. a ton in the northern districts. The price of Gloco will be 10s. a hundredweight or 196s. 6d. a ton.

LECTURE



Mr. C. H. Lewis (second from left) explains to six Tottenham schoolchildren the workings of a model used to demonstrate his Christmas lecture for young people at the Imperial College of Science and Technology, South Kensington. The lecture was held under the ægis of the Institution of Gas Engineers.

MASTER AND MISS THERM

Lady Barnett, TV personality, congratulates Master Therm (John Tyler, 15, of Wisbech, Cambridgeshire) and Miss Therm (Linda Jane Shelley, of Shirley, Southampton) who each received first prizes of £100 Premium Bonds in the Gas Council competition at the Café Royal, London, to find the outstanding boy and girl, able to cook and show practical ability.

RADIATION GROUP HAS NEW EXPORT SUBSIDIARY

WITH the formation of a new subsidiary Company, Radiation International Ltd., the firm of Radiation Ltd. has completed the co-ordination of all the Group's overseas activities.

The new Company replaces Radiation Group Export Sales Ltd. as well as the export divisions of the other subsidiaries, including Ascot Gas Water Heaters Ltd., and the Electrical Division of Radiation Ltd.

Mr. W. D. King (the Radiation Chairman) has been appointed Chairman of Radiation International Ltd.; Radiation directors Mr. A. J. Parker, Mr. F. P. S. Stammers and Mr. S. L. Pleasance are also on the Board.

Export managers

In addition the Board will include three Export General Managers, each of whom will be responsible for export activities over a wide area. They are: Mr. G. H. Behr (the Americas and Africa), Mr. V. P. Marciandi (Europe), and Mr. P. Wilkins (Middle and Far East and Australasia).

Supported by a team of Product Managers, the Export General Managers will provide an up-to-the-minute overall export service in each of the principal export markets for the Group's products.

The parent Board is confident that this re-organisation can increase the Group's already substantial exports of British designed domestic appliances.

The decision underlines the export potential of domestic appliances of all kinds—which are too often, though quite wrongly, regarded as essentially a 'home' product.

Four countries

Radiation already have overseas Companies in four countries—Australia, New Zealand, Canada and the U.S.A.—as well as carrying out a very substantial amount of export business from the Group's factories in this country.

The Group manufactures and markets under a number of famous brand names including: New World gas cookers, Ascot water heaters, Parnall home laundry, Jackson cookers and electric appliances, Bratt Colbran gas heaters, and Parkray solid-fuel appliances.

The Group has 19 subsidiary Companies in Great Britain. Its production centres and factories are strategically distributed throughout the country, areas particularly interested being: London, Birmingham, Bilston, Staffs., Belper, near Derby, Bristol, Luton, Leeds and Warrington.

CORRESPONDENCE

H_2S removal

Dear Sir—I read with interest your article in the GAS JOURNAL for October 26, 1960, describing the North Western Gas Board's new process for the removal of hydrogen sulphide from gases (p. 172). In this article it is claimed in the Applications Section that:

3. Cheap purification of a wide range of liquid products contaminated with hydrogen sulphide which are marketed by the oil industry.

This would seem to imply that the oil industry markets products contaminated with hydrogen sulphide. It is the general practice of refineries and certainly of all British Petroleum refineries to remove completely all traces of hydrogen sulphide before liquid products are marketed.

To avoid an erroneous impression being given to your readers concerning the quality of oil products I would like you to include the essence of this letter in your Correspondence column.

Yours faithfully,
J. W. Hyde.
Research Co-ordinator,
Research & Technical Development Dept.
B.P. Trading Ltd.

N.C.B. PAYS £73 MILL. TO GOVERNMENT

THE National Coal Board has paid £73 mill. to the Government. This was the interest on money lent to the Board as well as repayment of capital; last year it also included a repayment of £30m. borrowed in 1957 to finance coal stocks.

'These annual repayments to the Government are a reminder that the coal industry is not, in any sense, a liability to the taxpayer,' said a Coal Board spokesman. 'Every penny we borrow from public funds has to be repaid together with the interest accruing during the whole period of any loan.'

Durgapur steelworks progress

THE Indian Steelworks Construction Co. Ltd. (ISCON) is determined to beat the scheduled completion date in April 1961 of Stage III of the new £105 mill. Durgapur Steelworks, near Calcutta.

At the end of Stage III more than three quarters of the work will be finished, and at the present rate of progress it seems this target will be reached ahead of time.

Construction is now well advanced on the third and final units of the coke oven and blast furnace plant.

AN EXHIBITION

THE first Domestic Heating and Insulation-in-the-Home Exhibition, will be held in the Free Trade Hall, Manchester, from September 19 to 22, 1961.

NEWTON CHAMBERS ACQUIRE ROYSTONS

THE business of George Royston and Son Ltd., of Pogmoor, Barnsley, has been acquired by Newton Chambers and Company Ltd., of Thorncliffe, Sheffield.

Roystons design and manufacture chemical plant and equipment fabricated in mild steel, stainless steel, aluminium and special alloys. They specialise in sulphate of ammonia plant for the manufacture of Grade A sulphate.

Rotary dryers and cyclones are made by them and they also undertake a considerable amount of lead lining work for the coal, by-product and chemical industries.

Their activities will fit effectively into the expanding pattern of the Engineering Division of Newton Chambers, with benefit to both firms.

Under the new arrangement Mr. K. E. Walker, Director in charge of the Engineering Division of Newton Chambers, will be Chairman of the Company, and Mr. D. B. Royston will continue as Managing Director.

Early last year Newton Chambers acquired the sheet metal-working business of Rhodes and Halmshaw, Ltd., of Ossett, Wakefield, which is also linked with the Engineering Division at Thorncliffe.

Newton Chambers also bought the business of Ronuk Ltd., polish manufacturers, of Portslade, Sussex, and this is linked with the Chemicals Division of the parent company.

Ransomes and Rapier Ltd., the well-known and old-established firm of engineers at Ipswich, is also in the Newton Chambers Group, having been acquired in April 1958.

Sir Ernest Smith, C.B.E.

T. F. E. Rhead writes:

Sir Ernest's brilliant career has been well reported in both the national Press and several scientific journals. The writer felt, however, that a more personal account of the man who was known affectionately as 'E.W.' to many of his friends would not be out of place.

Our unbroken friendship started 53 years ago in the Honours School of Chemistry of Manchester University; 'E.W.', besides being an able student, had a natural gift for organising and even in those far off days this gift brought him to the forefront in student activities.

When he left Manchester and as the years progressed, this organising ability, together with a sympathetic understanding of human nature, made him a readily accepted leader.

It is not surprising, therefore, that he was elected president or chairman of several of the professional and scientific bodies or government-sponsored committees to which he belonged.

Although he disliked delving into detail or writing speeches, he had a ready grasp of essentials which, with his calm, deductive mind, enabled him to sum up the pros and cons of an argument with such clarity that an acceptable solution was often forthcoming.

His Unitarian background made him a man of high principles and great courage.

In his younger days he had been a keen athlete and throughout his life he had loved the open air and the countryside. One of the rambling clubs he helped to found in the Midlands is still going strong after 46 years.

Although widely-travelled, he was very much attached to his home and family circle.

To be one of 'E.W's.' friends was a rich experience and a great privilege. He was a staunch and true friend and performed many unheralded acts of kindness.

Truly his friends have sustained a great personal loss, and the Commonwealth has lost an outstanding leader.

COMING EVENTS

January 18.—WESTERN JUNIORS: Visit to the Works of Stothert and Pitt Ltd., Bath.

January 18. — MANCHESTER DISTRICT JUNIORS: Visit to National Gas Engine Co., Ashton-under-Lyne. Address by Dr. W. T. K. Braunholtz.

January 20. — WALES G.C.C.: Gas Offices, Bute Terrace, Cardiff. 11 a.m.

January 23.—WEST MIDLANDS G.C.C.: Conference Room, Gas Offices, Lord Street, Birmingham. 2.30 p.m.

January 24.—MIDLAND JUNIORS: 'The Distribution of Gas through Steel Pipelines,' by W. Jones.

January 25.—EASTERN JUNIORS: Cambridge. Paper by W. D. Harrison.

Board gives hot water

The picture shows hot water being given away to residents of Newtown, Montgomeryshire, by the local gas showroom during the recent severe flooding.

Weekly statistics

The total amount of gas available at gasworks during the week ended December 25, 1960, was 67.1 mill. therms. Coal consumed by the gas industry during the week ended December 24, 1960, was 505,000 tons, and by coke ovens 569,000 tons. Stocks of coal held by the gas industry for the same week stood at 1.975 mill. tons, and by coke ovens at 1.625 mill. tons.

PERSONAL NOTES

MR. S. J. STANBROOK has been elected a Director of Radiation Ltd., with effect from January 1. Mr. Stanbrook, a 45-year old Londoner, joined Parnall Aircraft Ltd. at Tolworth in January 1939, having previously been with E.M.I. He transferred to Ascot Gas Water Heaters Ltd., in February, 1941, became production manager in 1948, works manager in 1951, and general manager in 1953. He joined the board of Ascot Gas Water Heaters Ltd., in 1958, and Bratt Colbran Ltd., in 1960. In April, 1960, Mr. Stanbrook became general manager of Radiation's Warrington gas cooker production centre, and later a director of Richmonds Gas Stove Co. Ltd.

MR. N. G. LANG has retired from the post of secretary of Woodall-Duckham Ltd. and Woodall-Duckham Construction Co. Ltd. after more than 40 years' service with the Group. MR. L. WIGNALL, who has held the office of assistant secretary for the past 11 years, has been appointed his successor.

MR. R. G. WILSON has been appointed Manager of the Heating Division of Trianco Ltd., Imber Court, East Molesey. Mr. Wilson was previously with Radiation Ltd., where he was for a number of years technical sales manager of the Central Heating Division.

MR. ERIC GRANVILLE BUTTON has resigned from his post as advertising and publicity manager for Ideal Boilers and Radiators Ltd. Mr. Button has been connected with the building industry all his life and for five years with the gas industry.

MR. DENIS SCOTT WILSON, Assistant to the Gas Council's Scientific Adviser, has been awarded an M.B.E.

MR. J. RAMSAY has been appointed Managing Director of William Sugg & Co. Ltd., with effect from January 1. Mr. Ramsay succeeds Mr. W. T. Mattock, who has retired after 42 years association with the Company, but who remains a member of the Board and will be consultant to the Company.

MR. P. STEVENS, of the Meltham Silica Firebrick Co. Ltd., has been presented with an illuminated scroll for 45 years continuous service with the Company. MR. N. D. TASKER has received an award for 25 years continuous service, as has MR. J. ILLINGWORTH.

MR. J. D. SILK, MR. J. D. HULLOCK, and MR. H. O. W. HILEY have been appointed Directors of Clay Cross Ltd. Mr. Silk will retain the position of Commercial Manager, Mr. Hullock that of General Foundries Manager, and Mr. Hiley that of Company Secretary.

MR. P. W. SELIGMAN has been appointed Deputy Chairman of the A.P.V. Co. Ltd., while retaining his present position of Managing Director.

MISS MAYWEN GODBY, who has been on the staff of the Women's Gas Federation since 1947, has left to join the Gas Council as Home Economist to the Home Service Section.

COMMANDER COLIN BUIST, M.V.O., has been nominated to represent the Low Temperature Coal Distillers Association on the Executive Board of the British Tar Confederation.

MRS. I. T. BARCLAY, of London, has been re-appointed to the North Thames Gas Board.